Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte IRENE T. SPITSBERG, WILLIAM S. WALTSON
and JON C. SCHAEFFER

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Appeal No. 2002-0190
Application 09/149,018

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ON BRIEF

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Before GARRIS, WARREN and OWENS, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal is from the final rejection of claims 1-12 and 17-20. Claims 13-16, which are all of the other claims in the application, stand allowed.

THE INVENTION

The appellants' claimed invention is directed toward a method for making an article, such as an aircraft gas turbine vane or blade, having a protective coating. Claims 1 and 17 are illustrative:

1. A method for preparing an article having a substrate protected by an overlying coating, comprising the steps of

furnishing a substrate comprising a nickel-base superalloy; thereafter

depositing a first layer comprising platinum contacting an upper surface of the substrate; thereafter

depositing a second layer comprising aluminum contacting an upper surface of the first layer, leaving an exposed surface; and thereafter

final desulfurizing the article by removing sulfur initially in the substrate to yield

an article with a final-desulfurized exposed surface, the step of final desulfurizing including the steps of

heating the article to a final desulfurizing elevated temperature of from about 1800 F to about 1975 F in an atmosphere of a reducing gas, and thereafter

removing a layer of sulfur-concentrated material from the exposed surface of the article.

17. A method for preparing an article having a substrate protected by an overlying coating, comprising the steps of

furnishing a substrate comprising a nickel-base superalloy; thereafter

depositing a first layer comprising platinum contacting an upper surface of the substrate; thereafter

depositing a second layer comprising aluminum contacting an upper surface of the first layer;

the method further including the step of

desulfurizing the article after at least one of the steps of depositing the first layer and depositing the second layer, by the steps of

heating the article to elevated temperature, and thereafter

removing a thickness of from about 0.5 micrometers to about 2 micrometers of material from a surface of the article which was exposed during the step of heating.

THE REFERENCES

Rickerby et al. (Rickerby)	5,667,663	Sep. 16, 1997
McMordie et al. (McMordie)	5,922,409	Jul. 13, 1999
	(effective filing date	Feb. 28, 1994)

THE REJECTIONS

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1-5, 9, 11, 12, 17, 19 and 20 over McMordie, and claims 6-8, 10, 17 and 18 over McMordie in view of Rickerby and the appellants' admitted prior art.[1]

[1] The appellants' admitted prior art relied upon by the examiner is the disclosure that it was known in the art to apply a ceramic thermal barrier coating over a platinum-aluminide

OPINION

We reverse the aforementioned rejections. We need to address only the independent claims, i.e., claims 1 and 17.

Rejection of claim 1

McMordie discloses a method for preparing an article having a substrate protected by an overlying coating (abstract), comprising furnishing a substrate comprising a nickel-base superalloy (col. 5, lines 23-25; col. 9, lines 25-28), then depositing a first layer comprising platinum contacting an upper surface of the substrate (col. 7, lines 12-35), and then depositing a second layer comprising aluminum and silicon onto an upper surface of the first layer, leaving an exposed surface (col. 6, lines 23-32; col. 7, lines 36-63; col. 8, lines 53-65). "The aluminum-rich layer is heated in a non-reactive environment to a diffusion temperature above about 660°C., which is sufficient to melt the aluminum powder, which in turn can dissolve the silicon and any other metallic powders. For nickel -base alloys, this diffusion temperature should be fixed above about 870°C. (1600°F). Suitable non-reactive environments in which the diffusion may be performed include vacuums and inert or reducing atmospheres" (col. 8, line 66 - col. 9, line 9).

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coating (page 2, lines 9-15).

McMordie is silent as to whether the article contains sulfur. However, McMordie discloses depositing the platinum layer by electroplating (col. 7, lines 12-15; col. 9, lines 62-63; col. 10, line 67; col. 14, lines 19-20), and the examiner finds, based upon the appellants' specification, that a platinum layer formed by electroplating necessarily contains sulfur (answer, page 7).[2] Because the examiner's finding is reasonable and the appellants have not argued that it is incorrect, we accept it as fact. *See In re Kunzmann*, 326 F.2d 424, 425 n.3, 140 USPQ 235, 236 n.3 (CCPA 1964).

The examiner argues that McMordie grit blasts the aluminum/silicon layer in order to remove undiffused coating residues, and that because this process step is the same as that of the appellants, it would remove sulfur-concentrated material as required by the appellants' claim 1 (answer, pages 3-4). The examiner, however, has not established that McMordie's undiffused aluminum/silicon slurry material, i.e., material which has not diffused into the platinum-coated substrate, contains sulfur. Hence, the examiner has not established the McMordie would have fairly suggested, to one of ordinary skill in the art, removing a

[2] The specification states (page 4, lines 3-7): "The deposition of the platinum-containing first layer and the aluminum-containing second layer leave these layers with a relatively high sulfur content. In particular, the first layer is normally electrodeposited onto the surface of the substrate, which leaves a high sulfur content in the first layer."

layer of sulfur-concentrated material as required by the appellants' claim 1.[3]

We therefore conclude that the examiner has not carried the burden of establishing a *prima facie* case of obviousness of the methods recited in the appellants' claims 1-5, 9, 11, 12 and 20.

Rejections of claim 17

For the reasons given above regarding the rejection of claim 1, the examiner has not established that McMordie would have fairly suggested, to one of ordinary skill in the art, desulfurizing the article.

As for the requirement in the appellants' claim 17 that the thickness of material removed from the surface of the article is about 0.5 to about 2 micrometers, the examiner argues that this thickness is inside the disclosure of McMordie (answer, page 2). McMordie, however, does not disclose the thickness of the layer of undiffused coating residue that is removed, and the examiner

[3] Moreover, in each instance in which McMordie discloses removing undiffused coating residues, the diffusion temperature is 885ºC, which is below the temperature range recited in the appellants' claim 1 (982-1079ºC). When McMordie uses diffusion temperatures within the appellants' range, there is no disclosure of removing undiffused residues (col. 11, lines 8-9; col. 13, lines 5, 13, 30 and 40). The examiner has not established that McMordie would have fairly suggested, to one of ordinary skill in the art, carrying out the diffusion at a temperature within the appellants' range and then removing undiffused coating residues.

has not established that the thickness of McMordie's removed undiffused coating material necessarily is the same as that of the layer removed during the appellants' desulfurization method, or that McMordie's disclosure of removing undiffused coating residues would have fairly suggested, to one of ordinary skill in the art, the particular thickness of the removed layer recited in the appellants' claim 17.

The examiner does not rely upon Rickerby or the appellants' admitted prior art for a teaching which remedies the deficiency in McMordie as to claim 1, from which claims 6-8 and 10 directly or indirectly depend, or claim 17.

Accordingly, we conclude that the examiner has not carried the burden of establishing a *prima facie* case of obviousness of the methods recited in the appellants' claims 6-8, 10 and 17-19.

DECISION

The rejections under 35 U.S.C. § 103 of claims 1-5, 9, 11, 12, 17, 19 and 20 over McMordie, and claims 6-8, 10, 17 and 18 over McMordie in view of Rickerby and the appellants' admitted prior art, are reversed.

REVERSED

Bradley R. Garris Administrative Patent Judge	)
Charles F. Warren Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
Terry J. Owens Administrative Patent Judge	)

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